DESCRIPTION OF TWO SPECIES OF PALMOXYLON—ONE NEW—FROM LOUISIANA.

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(With Plate XXX.)

On February 29, 1888, several specimens of fossil palms were received in the Department of Fossil Plants of the U. S. National Museum that had been collected by Mr. Lewis C. Johnson, of the U. S. Geological Survey, in Rapides Parish, La. They appeared to be very well preserved fragments, in some cases nearly 8 inches in diameter, and from 3 to 5 inches in length. They are completely silicified, and are yellowish-gray in color. The fibro-vascular bundles show very distinctly in transverse section, and their irregular or undulating course through the stone is also clearly shown when broken longitudinally.

The difficulties in the way of the satisfactory determination of monocotyledons, by a study of internal structure alone, are much greater than the determination from similar parts of conifers or dicotyledons. The reasons for this are, that monocotyledonous stems are in general less susceptible of satisfactory preservation in the fossil state, consisting as they do largely of parenchematous tissue, with large intercellular spaces; and also because the study of living forms, which furnishes the basis for all studies of fossil forms, has not been as exhaustively undertaken. Particularly is this true of the study of fossil palms. So little is at present known regarding the internal structure of the living species that it is only possible in the present state of our knowledge to mass together all the fossil species under the comprehensive generic name of Palmoxylon, or simply "palm-wood." It is true that the described species of Palmoxylon differ considerably among themselves, and it is more than probable that characters will ultimately be obtained that will allow of a separation into several generic types.

Two generic types, Fasciculites and Palmacites, were recognized by the earlier writers, mainly from the microscopic appearance of the trunks; but Schenk, who had opportunity of studying much of the original material as preserved in the Dresden Museum, concluded that it was on the whole best to recognize only a single generic type, for which he proposed the name Palmoxylon.* The most complete enumeration of species is that given by Dr. Felix in his exhaustive paper on the Fossil Woods of the West Indies.† Most of the species mentioned come from the island of Antigua, but several are from European localities.

*Engler's Botan. Jahrb., Vol. III, 1882, p. 355.

†Die foss. Hölz. Westindiens. Samml. paläont. Abhandl., Ser. I, Heft 1. Cassel, 1883, pp. 22-27, Pl. IV, V.

The species are divided by Felix into two sections, the first of which includes those having sclerenchyma bundles scattered between the fibro-vascular bundles, and the second of which includes the species without sclerenchyma bundles. The first section includes most of the species described by Felix. The two species from Louisiana represent both sections.

The species belonging to the first section I am inclined to identify with a species described by Felix, from Antigua, although it differs from it in some relatively important features.

Palmoxylon Quenstedti Felix, Foss. Hölz. Westindiens, p 25, Pl. IV, fig. 4.

Described by Felix as follows: Fibro-vascular bundles extraordinarily numerous, the bast portion strongly developed, and the xylem portion very much reduced, or not well preserved. Sometimes the bast portion surrounds the xylem and sieve tissues, so as to give the appearance of their lying in an opening of the bast tissue. Numerous isolated bundles (Faserbündeln) of very considerable size appear about the fibro-vascular bundles. The fundamental or parenchymatous tissue is composed of long, but rather small, cells without intercellular spaces.

The form from Louisiana agrees well with this description, but has not been as well preserved. The fibro-vascular bundles have been very numerous, particularly near the periphery of the stem, as also have been the smaller sclerenchyma bundles.

The fundamental tissue has not been preserved except in immediate contact with the fibro-vascular bundles. It is then seen to be composed of small, nearly regular, cells, with few small intercellular spaces among them.

The specimens from Antigua upon which this species is founded, were first collected by Quenstedt in 1867,* who recognized at once their palm-like structure. They were opalized in a very beautiful manner.

Palmoxylon cellulosum, n. sp. Plate XXX, fig. 2.

This species, as stated above, belongs to the section characterized by the absence of sclerenchyma bundles outside of and among the fibro-vascular bundles. The fundamental tissue is composed of large, irregular cells, between which are very large intercellular spaces. The tissue is more compact in the vicinity of the bundles, but is loose and spungy in general. The fibro-vascular bundles have been moderately numerous. They are large, usually elliptical in outline. The bast cells are large, with the lumen reduced to a minimum, while the xylem portion is nearly completely surrounded.

The fundamental tissue of this species bears a strong resemblance to that of *Palmoxylon lacunosum* Felix, and would be referred to it but for the absence of the isolated sclerenchyma bundles, which so clearly marks the species of Felix.

Rapides Parish, the locality from which these fossils were obtained,

*Handbuch d. Petrefactenkunde, 2. Aufl., p. 883.

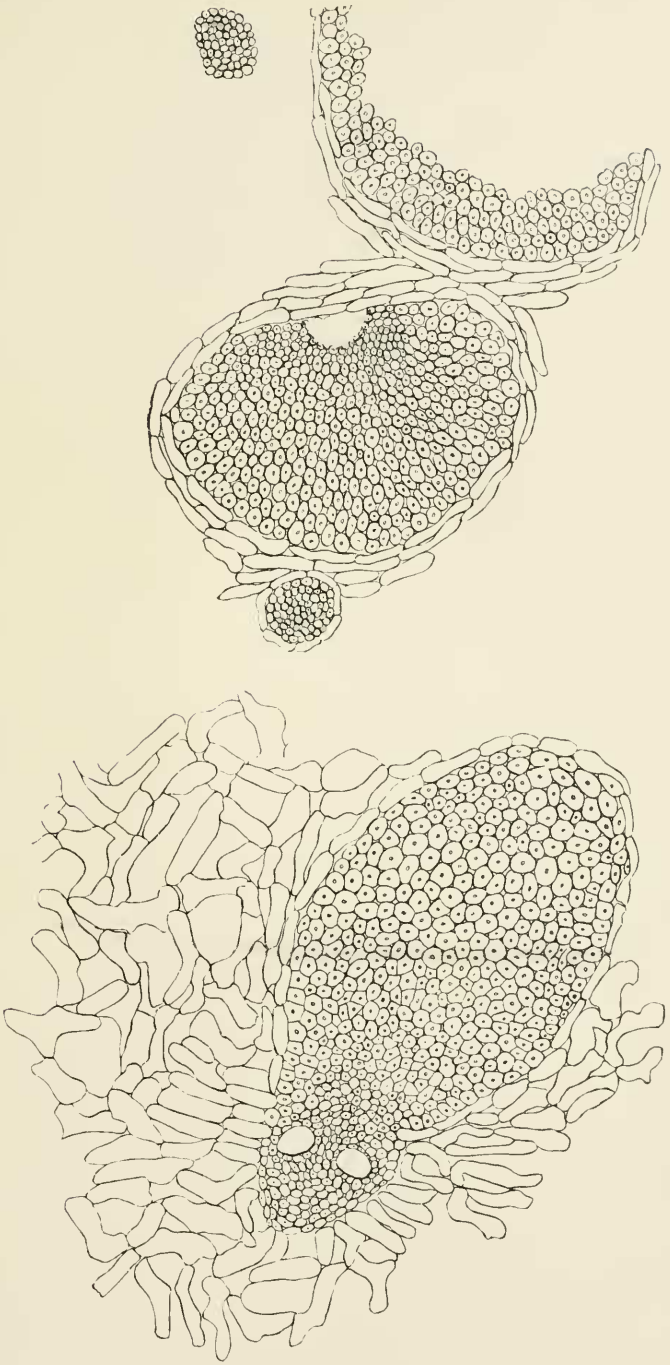

FIG. 1. *Palmoxylon Quenstedti* Felix. (Page 90.) FIG. 2. *Palmoxylon cellulosum*, n. sp. (Page 90.)